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BRIEF ON APPEAL
EXPEDITED PROCESSING
GROUP ART UNIT: 3652

Attorney Docket :
033082M116

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

CONF. NO. 1344

In re the application of:	)	
	)	
Hiroaki SAEKI, et al.	)	Group Art Unit: 3652
	)	
Application No.: 10/048,012	)	Examiner: Brahan, T.
	)	
Filing Date: 01/25/2002	)	

For: TRANSFER SYSTEM FOR OBJECT TO BE PROCESSED

BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

A notice of appeal was filed on November 15, 2005. This is Applicant's Brief on Appeal. According to the Advisory Action, the claim amendments set forth in the Amendment filed September 15, 2005 overcame all of the 35 USC 112 issues. Therefore, the issues remaining for this appeal relate to the prior art rejections set forth in the Final Official Action dated June 15, 2005.

REAL PARTY IN INTEREST

The owner of this application is Tokyo Electron Limited, a corporation of Japan having a place of business at 3-6 Akasaka 5-chome, Minato-ku, Tokyo-to, Japan.

RELATED APPEALS AND INTERFERENCES

To the best of the undersigned's knowledge, no other appeals or interferences will directly affect, will be directly affected by, or will have a bearing on the board's Decision in this appeal.

STATUS OF CLAIMS

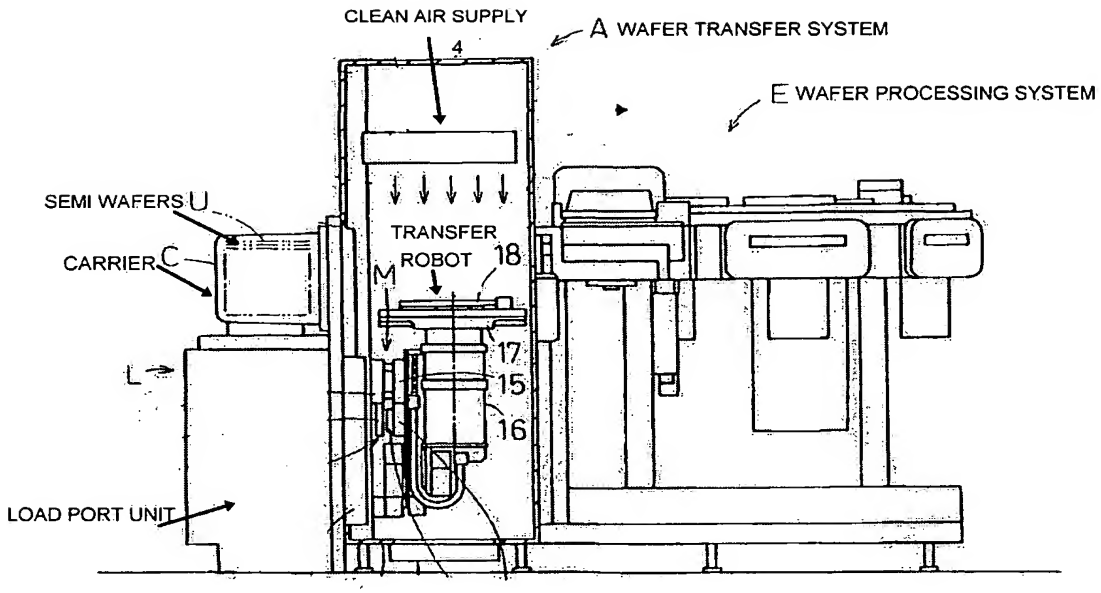
Claims 1-4 and 6-7 remain pending in the application and are under appeal. These claims are listed in a Claims Appendix as required by 37 C.F.R. 1.192 (c) (9).

STATUS OF AMENDMENTS

Appellant filed an Amendment After Final filed on September 15, 2005. This amendment was entered and has been made of record. It has been considered by the Examiner. According to an Advisory Action dated September 29, 2005, the claim changes set forth in the Amendment of September 15, 2005 have been entered and were deemed to overcome all outstanding 35 USC 112 rejections.

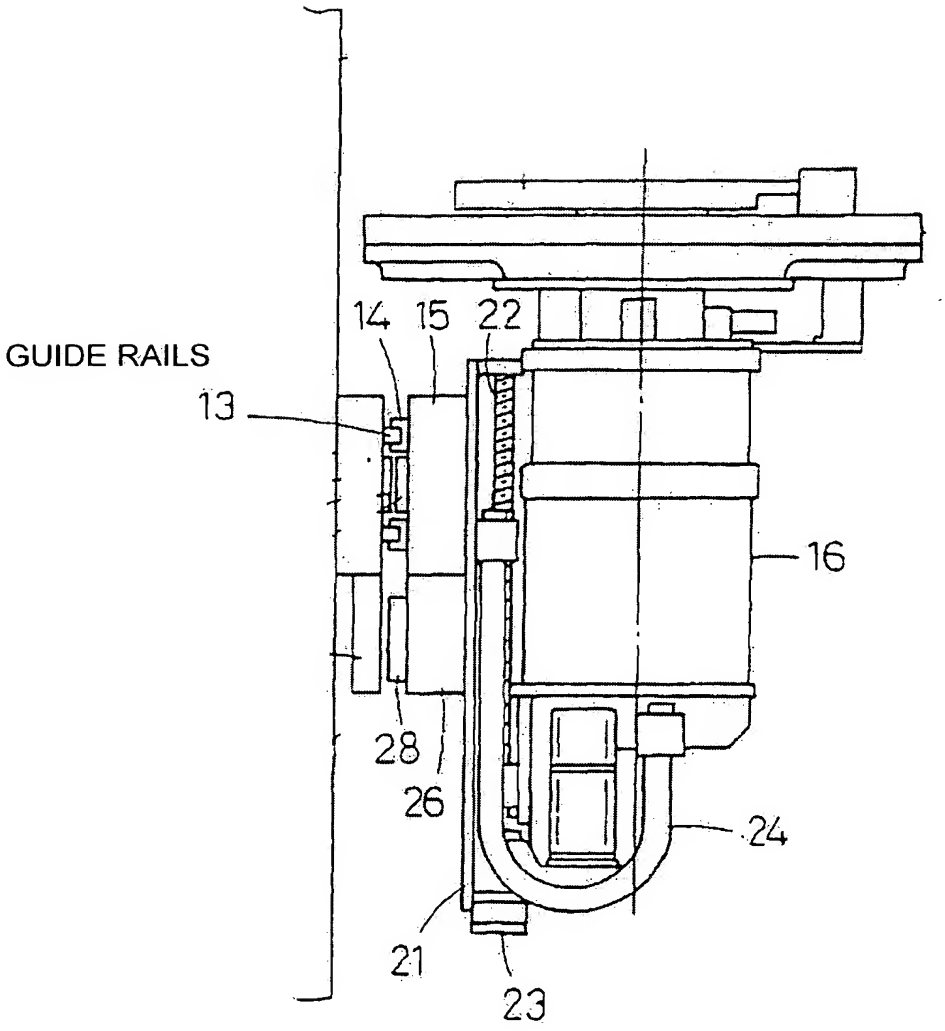
SUMMARY OF CLAIMED SUBJECT MATER

All of the pending claims relate to a wafer transfer system (A) useful in semiconductor fabricating systems. Wafer transfer system (A) transfers an unprocessed semiconductor wafer (U) from a carrier (C), containing multiple wafers, to a wafer processing system (E). After the wafer has been processed, transfer system (A) transfers the processed wafer back to carrier (C). When carrier (C) is brought for processing, it is mounted on a top face of a load port unit (L). The figure below is patent application Figure 1 with many reference numerals deleted and labels added.



Patent Application Figure 1

Wafer transfer system (A) includes a clean air supply 4 to minimize dust settling on semiconductor wafers and a transfer robot (R) which can move wafers (U) to/from the carrier (C) one at a time. The transfer system is propelled by a linear motor M which runs along guide rails (13). Both the load port unit (L) and guide rails (13) are mounted on a front wall (1a) of a transfer system (A) system body (1). The guide rails are shown in redacted Figure 4 of our application set forth below.



Thus, the load port unit (L) and guide rails (13) are positionally fixed with respect to each other. In other words, both the load port unit and the guide rail are commonly fixed on the front wall.

The robot (R) linearly reciprocates along the guide rails (13). Therefore, because the guide rails and the load port unit are fixed to the same structure (front wall), there is a precise positional relationship between the transfer robot (R) and the carrier (C) positioned on the top face of the load port (L). As a result, the transfer robot accesses the carrier without positional errors common to prior art arrangements. Robot (R) can precisely transfer wafers to and from

the carrier (C). Because, in wafer processing systems, a plurality of stages can be arranged in tiers, with wafers stacked at each stage, such precise movement and positioning of the transfer robot (R) is important.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following issues are presented for consideration in this appeal.

Issue #1

Whether claims 1 and 7 properly have been rejected under 35 U.S.C. 103(a), as being obvious based on Hendrickson et al. (U.S. Pat. No. 6,257,827) in view of Van Doren et al. (U.S. Pat. No. 5,733,096).

Issue #2

Whether claims 2 and 3 properly have been rejected under 35 U.S.C. 103(a) as being obvious over Hendrickson et al. in view of Van Doren et al., and further in view of Akimoto et al. (U.S. Pat. No. 5,844,662).

Issue #3

Whether claims 4 and 6 properly have been rejected under 35 U.S.C. 103(a) as being obvious over Hendrickson et al. in view of Van Doren et al., and further in view of Teramachi (U.S. Pat. No. 4,681,506) or Sakino et al. (U.S. Pat. No. 5,040,431).

GROUPING OF THE CLAIMS

For consideration of this appeal the claims can be grouped together.

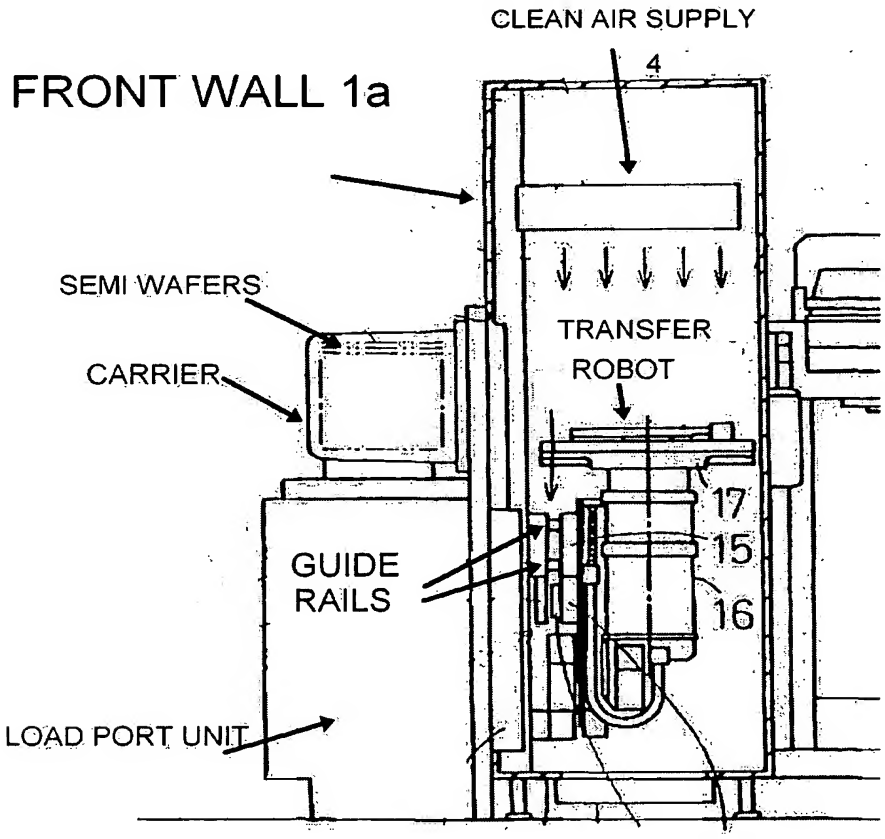
ARGUMENT

A. All of the rejections fail to establish Prima Facie Obviousness.

Independent claims 1 and 3 are directed in general to a transfer system particularly useful in semiconductor wafer manufacture. The transfer system transfers a wafer to be

processed both out of and back into a carrier (C) mounted on a top face of a load port unit (L). Both the load port unit and a guide rail are mounted on the front wall of the system body so that they are positionally fixed with respect to each other. In other words, both the load port unit and the guide rail are commonly fixed on the front wall.

The robot linearly reciprocates along the guide rail. As shown in the figure below, because the guide rail (into and out of the paper in the figure below) and the load port unit are fixed to the same structure (front wall 1a), there is a precise positional relationship between the transfer robot and the carrier positioned on the top face of the load port.



As a result, the transfer robot accesses the carrier without positional errors, and precisely transfers objects to and from the carrier. Because, in wafer processing systems, a plurality of stages can be arranged in tiers, with wafers stocked at each stage, precise movement and positioning of the transfer robot is important.

Specifically, claim 1 requires:

- carrier mounted on a top face of load port
- guide rail
- linear motor having a primary side and secondary side
- primary side extends in lateral directions of a system body
- primary side movable with respect to secondary side
- a transfer robot mounted on the primary side of linear motor
- transfer robot linearly reciprocates along guide rail,
- both load port unit and the guide rail are mounted on a front wall of system body
- load port unit mounted on the outside of the front wall of system body
- guide rail is mounted inside of said front wall of system body,
- primary side and the secondary side have vertical oriented opposing faces
- robot transfers object from/to carrier positioned on the top face of the load port unit.

Independent claim 7 requires a similar combination of features.

The prior art does not teach fixing the guide rails and load port unit to the same structure so that they are positionally fixed with respect to each other. In order to find this combination of features, the Examiner combines the teachings of Hendrickson et al and Van Doren et al. The Examiner suggests modifying the Hendrickson et al arrangement so as to "accurately position the robot" in the manner taught by Van Doren et al. The Examiner suggests further modifying these combined teachings based on design choice. According to the Examiner, locating the secondary side of the linear motor and its guide rail on the front

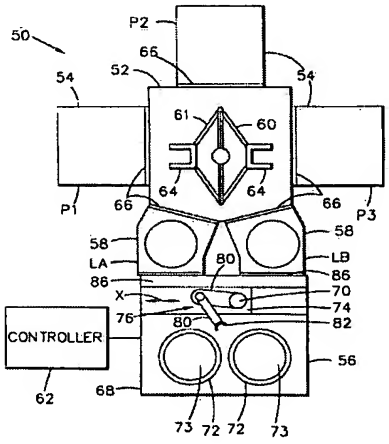
side of the system body would have been an obvious choice of design, within the limits of routine skill in the art at the time the invention was made by applicant.

Thus, the Examiner admits that even combining the teachings of Hendrickson et al and Van Doren et al alone do not meet the limitations of claim 1. There must be even further modification of the Hendrickson et al arrangement to properly locate the guide rails.

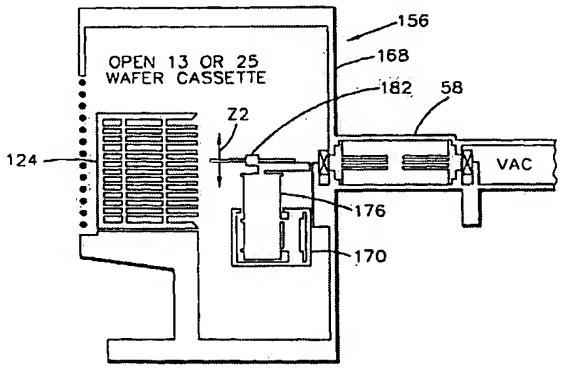
The Examiner asserts that Hendrickson teaches a system having both the load port unit (72) and the guide rail mounted on the front wall (68) of the system body. In Hendrickson's system, the cassette (73) is moved vertically with respect to the load port unit (72). See column 4, lines 46-48.

> The substrate cassette holders 72 are adapted to vertically move the cassettes 73 relative to the frame 68 as indicated by arrow Z2.

Hendrickson Figure 2, below, shows cassette holders 72, cassettes 73 and frame 68. Hendrickson Figure 3A, below, shows arrow Z2 referred to in the quoted passage.



Hendrickson Figure 2



Hendrickson Figure 3

In other words, in Hendrickson's system, the cassette (73) is moved to the transfer robot (76) instead of moving the transfer robot (76) to the cassette (73) when a wafer is transferred from and to the cassette (73). In Hendrickson's system, the movement of the transfer robot (76) is to access load locks (58) and not to transfer a wafer from and to the cassette (73).

Since it is the cassette (73) that is moved vertically with respect to the load port unit (72), a precise positional relationship cannot be attained between the transfer robot (76) and the carrier (73). This is so even if both the load port unit (72) and the guide rail are mounted on the front wall (68) of the system body in Hendrickson.

In contrast, in our claimed arrangement, carrier (C) is mounted on the top face of the load port unit (L) and does not move with respect to the load port unit (L). Rather, it remains stationary. Then, as explained above, because the guide rail and the load port unit are fixed to the same structure in our claimed arrangement, there is a precise positional relationship between the transfer robot and the carrier positioned on the top face of the load port. This precise positional relationship leads to operational advantages over systems not having such a precise positional relationship.

These features are neither taught nor fairly suggested by Hendrickson et al or Van Doren et al. In addition, there is nothing in the teachings of either of these references that suggests why one of ordinary skill in the art would modify the Hendrickson et al arrangement in a manner taught by Van Doren et al and then to make further design choices in order to achieve the unique combination of features described above.

The rejection of claims 2 and 3 is similar but it is made further in view of Akimoto et al. The deficiencies of Hendrickson et al and Van Doren et al are discussed above. Akimoto et al is cited for its teaching of a clean air system. Its teachings are not disputed. However, the reference does not cure the insufficiency of the combined teachings of Hendrickson et al and Van Doren et al. The cited references simply to not suggest a transfer system having a carrier that is mounted on the top face of the load port unit wherein the carrier remains stationary thereby enabling a precise positional relationship between the transfer robot and the carrier.

There is nothing in the teachings of the cited patents which would have motivated those of ordinary skill to have arrived at Applicants' claimed structural arrangement.

With respect to claims 4 and 6, the Examiner further relies upon Teramachi or Sakino et al. Again, the deficiencies of Hendrickson and Van Doren are discussed above. Neither of these additional references remedy the deficiencies described above with respect to the basic combination of Hendrickson et al and Van Doren et al. None of the cited patents teaches or fairly suggests a transfer system having a carrier that is mounted on the top face of the load port unit wherein the carrier remains stationary thereby enabling a precise positional relationship between the transfer robot and the carrier. There is nothing in the teachings of the cited patents which would have motivated those of ordinary skill to have arrived at Applicants' claimed structural arrangement.

* * * * *

Applicants respectfully submit that this Brief on Appeal establishes that the Examiner's rejections should be reversed.

If any additional fees are due in connection with the filing of this Amendment, such as fees under 37 C.F.R. §§1.16 or 1.17, please charge the fees to Deposit Account 02-4300; Order No. 033082.116.

Respectfully submitted,

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Dated: January 13, 2006

Claims Appendix

The following is a complete listing of the claims as they stand on appeal.

Claim 1. A transfer system for transferring an object to be processed out of a carrier which is mounted on a top face of a load port unit and for transferring the object to the carrier, said transfer system comprising:

a system body having a bottom, a front wall vertical with respect to the bottom, and a guide rail provided so as to extend in lateral directions of said system body;

a linear motor having a secondary side provided so as to extend in lateral directions of said system body and a primary side movable to the secondary side; and

a transfer robot which is mounted on the primary side of said linear motor and which is capable of linearly reciprocating along the guide rail,

wherein both said load port unit and the guide rail are mounted on the front wall of said system body, said load port unit is mounted on the outside of the front wall of said system body, and the guide rail is mounted inside of said front wall of said system body,

the primary side and the secondary side have vertical oriented opposing faces, and

the transfer robot transfers the object from and to the carrier positioned on the top face of the load port unit.

Claim 2. A transfer system as set forth in claim 1, which further comprises an exhaust fan which is provided on the bottom of said system body.

Claim 3. A transfer system as set forth in claim 2, which further comprises a clean air supply system for supplying clean air to said object which is transferred by said transfer robot, said clean air supply system being provided in an upper portion of said system body.

Claim 4. A transfer system as set forth in claim 1, which further comprises a braking device including:

a movable body which is mounted on one of the primary and secondary sides of said linear motor, said movable body being subject to a magnetic attraction of a coil, which is included in said one of the primary and secondary sides, against a resilient restoring force of a compression spring acting in the opposite direction to said magnetic attraction; and

a brake plate which is mounted on the other side of the primary and secondary sides of said linear motor so as to face said movable body, said brake plate being contacted pressingly with said movable body by interrupting the feeding of power to said coil.

Claim 5. (canceled)

Claim 6. A transfer system as set forth in claim 4, wherein said system body is provided with an emergency stop switch for emergency-stopping a processed-object transfer robot, and the feeding of power to said coil is interrupted by operating said switch.

Claim 7. A semiconductor fabricating system comprising:

a transfer system for transferring an object to be processed out of a carrier which is mounted on a top face of a load port unit and for transferring the object to the carrier, said transfer system comprising:

a system body having a bottom, a front wall vertical with respect to the bottom, and a guide rail provided so as to extend in lateral directions of said system body;

a linear motor having a secondary side provided so as to extend in lateral directions of said system body and a primary side movable to the secondary side; and

a transfer robot which is mounted on the primary side of said linear motor and which is capable of linearly reciprocating along the guide rail,

wherein both said load port unit and the guide rail are mounted on the front wall of said system body, said load port unit is mounted on the outside of the front wall of said system body, and the guide rail is mounted inside of said front wall of said system body,

the primary side and the secondary side have vertical oriented opposing faces, and

the transfer robot transfers the object from and to the carrier positioned on the top face of the load port unit, and

a processing means for processing the object to be processed.

Claims 8 and 9. (canceled)

*** End of Claims Appendix